CONSTRUCTION FOR SMALL PROJECTS

TYPES OF CONTRACTS

The two basic types of contracts are fixed-price (also called lump-sum) and cost-plus. Basis of payment for fixed-price is a stipulated amount. Fixed-price contracts should be used to the maximum extent feasible. Basis of payment for cost-plus is the actual cost of the construction plus a fee. Cost-plus contracts should be used only for specialty work and where it is unreasonable to expect the contractor to take the client's (NPS) risk on unknown elements. For example, when the volume of a shaft is unknown, the quantity of backfill should be contracted on a unit cost plus fixed or incentive fee.

If it is determined that a cost-plus contract is appropriate for a certain part of the project, separate this part from the main contract and handle the main contract on a fixed-price basis. As many elements of the project as practicable should be contracted on a fixed-price basis.

Other contract variations include fixed-price-incentive-fee, cost-plus-award-fee, and cost-plus-incentive-fee.

NPS PLANNING FOR CONSTRUCTION

NPS functions should be done on time with no unnecessary disruption to contractor plans. When equipment or materials are supplied by NPS or other participants, assure that deliveries comply with schedules to minimize requests for time extensions and cost increases. Allow time for bidding, bid evaluation, award, and subsequent mobilization by the contractor.

For cost-plus contracts, select contractor early so that contractor can contribute practical and economical suggestions, and help in project design and construction schedule.

In addition:

1. Set aside adequate work space for the contractor and free access to the work area. In situations where several independent contractors will be working in the same area at the same time, develop procedures to coordinate their work and handle the unavoidable conflicts.

2. Orient the contractor as to:

    a. Authority and responsibilities of the contract officer, project manager, architect-engineer, inspectors, and other project participants.

b. Administrative procedures for review and approval of shop drawings.

c. Procedures for changes to the contract.

d. Provisions for special safety (such as abandoned mines), environmental protection, security, quality assurance, and other requirements for performance.

e. Conditions under which the work shall be performed and accepted.

f. Reporting procedures, and coordination of contractor's cost and schedule control with NPS project management staff.

g. Furnish contractor with applicable NPS regulations and procedures.

3. Cost and schedule breakdowns must be reviewed by the project manager, architect-engineer, and approved by the contract officer. Upon approval, the breakdown and reimbursement factors become the basis for progress payments.

4. Approve contractor's management plan including organization, key personnel, reporting and records procedures, subcontract procurement, construction plan, manpower scheduling, and cost control.

As appropriate, the contract should incorporate the preceding items.

INSPECTION

The project manager may elect to have inspection services performed by the architect-engineer, a construction manager, or with in-house experts. NPS personnel should not conduct the inspections unless the construction is routine or qualified experts are performing the inspections. Inspection services are never performed by the construction contractor.

Generally, inspection services include the following:

1. Establish and maintain survey control and benchmarks for horizontal and vertical references.

2. Verify all shop drawings to assure conformity with approved design, working drawings, and specifications.

3. Inspect and approve workmanship, materials, and equipment.

   a. Functional inspections determine the overall compliance with contract drawings and specifications, determine the adequacy of the design work, and include testing of operating equipment.

   b. Detailed inspection includes verification of details, such as checking location and size of reinforcing bars, maintaining records of concrete testing, verifying the use of proper welding rods, checking riveting and welding, and other inspection for quality assurance purposes. It starts with initial construction operations and extends through all construction stages.

   c. Continuous inspection and testing must be done for all work where the quality cannot be determined after construction without detriment to the work. This would be the case for all permanent mine closures.

4. Inspection instructions should provide the following:

   a. Statement of quality characteristics to be inspected.

   b. Organization or individuals responsible for inspection.

   c. Acceptance and rejection criteria.

   d. Methods of inspection.

   e. Evidence and records of inspection.

5. Conduct or procure field or laboratory tests of construction workmanship, materials, and equipment.

6. Evaluate scope changes and other proposals submitted by the construction contractor. Prepare estimates of changes in the contract price and schedules.

7. Prepare monthly progress reports including the status of material and equipment deliveries, and reports of work performed for payment.

8. Furnish reproducible "as built" drawings and marked up specifications showing construction as actually accomplished.

Inspection schedules should be based on the construction schedules and the project quality assurance plan.

1. Inspection should be conducted prior to acceptance of the work.

2. Inspection should be done when and where necessary to provide the degree of assurance required to determine that the materials and construction comply with the contract, drawings, and specifications.

3. Inspection requirements and testing should be clearly defined in the contract documents along with the authority, duties, and responsibilities of the inspectors.

Final acceptance is a written statement by the project manager that the work performed by the construction contractor has been accepted as being in accordance with approved plans and specifications.